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# PRIMARY CANCER

OF THE

## BRAIN :

AN INQUIRY INTO ITS PATHOLOGY, WITH STATISTICS AS TO ITS FREQUENCY,  
AND ILLUSTRATIVE CASES.

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## PREFACE.

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THE unexpected discovery of a malignant tumour, while examining the brain of a lunatic, first drew my attention to the subject of cancer of the brain, and subsequently, when opportunity offered, I commenced an examination of the *post-mortem* records of the London Hospitals, with a view to determining the frequency of occurrence of this disease. The following pages, which contain the results of my investigations, give, I believe, a fair view of the best pathological experience on the matter and such information as they afford will not be without value to those few who feel an interest in the *pathology* of a disease, which admits neither of cure nor relief.

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ON

## PRIMARY CANCER OF THE BRAIN.

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It is very remarkable with what tenacity a name maintains its existence long after the circumstances in which it took its origin have ceased to have any significance; and, indeed, so great is the vitality of certain words as to give a colour of truth to the somewhat extravagant doctrine of the Coleridge school, that the language of any people among whom culture is of old date, is a sacred deposit, the property of all ages, and which no one age should consider itself empowered to alter.

But though many terms have survived the ages which created them, their meaning has in process of time undergone various transformations, which have done all that a second Babel could have effected towards a confusion of ideas, and by this means an inexactness has arisen in their application productive of much mischief. The English language affords many familiar examples of these changes, which have been rendered harmless, chiefly from the fact that people have been reconciled to them by habit and use, but the same reason does not apply to scientific terms, which are a sort of coinage current among the learned of all nations, and whose value cannot be altered at the caprice of individuals without disturbing the common language of intercourse.

Of the evils resulting from this process, the history of the word *cancer* is no bad illustration. For more than 2,000 years this word has been in common use, and, though it had at first only a limited application, it is still used to designate a large and important class of diseases, many of whose forms have but slight resemblance to those for which it was at first framed. It is not difficult to understand how, with an idea of describing an external appearance, the early writers compared a diseased product with a familiar object; and how it has thus happened that a fancied resemblance to a crustacean provided with an odd method of progression, has furnished one of the most frequent and important of diseases, with a name which has been handed down from generation to generation unchanged. Galen, who lived in the first century (A.D.), gave as his explanation of the origin of the term cancer, "that as the crab is furnished with claws on both sides of its body, so in the carcinoma, or *carcinos*, the veins which are extended from the tumour represent with it a figure like a crab, hence the disease is called cancer."

This, doubtless, satisfied the early observers, who only recognized one form of cancer—viz., scirrhus; but, as time moved on and knowledge increased, many other forms of morbid growths, not at all resembling this, were noticed and embraced under the same head, and thus a term first given to a tumour on the surface of the body was made to include a number of growths in all parts of the frame, having one or two main features in common, chiefly their increase despite all treatment. By giving every variety of appearance the name of a fresh species, the list of cancers was soon augmented, and though it has been reduced by a stricter classification, even in these latter days the most moderate pathologists have enumerated from eight to twelve varieties.

Thus Rokitausky, in 1855, sub-divided malignant



disease into—1, fibrous carcinoma; 2, medullary (*a*, villous cancer; *b*, cancer melanodes); 3, epithelial cancer; 4, gelatinous cancer; 5, carcinoma fasciculatum; and 6, cysticnm. Lawrence, in 1856, made 11 divisions, and Paget, in 1853, proposed the terms scirrhus, medullary epithelial, colloid, osteoid, melanotic, villous, and hæmatoid.

But not less vague than the etymology have been the ideas successively promulgated as to the nature of the disease. Thus, so recently as 1809, we read in Parr's Medical Dictionary, a work then of some authority, " Celibacy, as well as the cessation of the menses, conduce to the production of cancers, and, consequently, antiquated maids are the most subject to them." It was also supposed that cancer was more frequent "in the dark cadaverous complexion than in the fairer kind;" and, in speculating as to the causes of the disease, the same author observes, in reply to the question, " But what is this depraved state of the blood which will produce such a destructive enemy?" " We can answer that it is an excess of ammonia, with a more copious development of an ingredient in the animal fluids, which we have so anxiously pointed out, sulphur."

This theory, however, was rivalled by the well-known one of Mr. Adams, that " cancers were owing to animals of the hydatid kind." Larger experience corrected many of these notions, but the use of the microscope probably assisted more than anything in advancing the real knowledge of the subject, though the anticipations at first formed of its powers in discriminating between every form of morbid growth have been by no means realized. Lebert, who thought " a cancer cell may be distinguished from every other kind of cell, and is pathognomonic," and Muller, who considered " no single element diagnostic," represented the two extremes of opinion, so to say, the hopes and fears of pathologists; and though experience has shown the in-

correctness of Lebert's view, there can be no doubt that it is to the microscope we must chiefly trust in determining the true position of any growth in the catalogue of disease. This point which, perhaps, would not meet with many objectors, is well illustrated by a case related by Dr. Hughes Bennett in his "Cancerous and Cancroid Growths," where (in Obs. 32) he describes a tumour attached to the tentorium, and pressing on the cerebellum. The tumour, the size of a hen's egg, was composed of "an agglomeration of imperfectly formed bodies, usually denominated tubercle corpuscles. From this circumstance, as much as from the occurrence of old tubercular caverns in the lungs, we can have little hesitation in considering its nature to be tuberculous instead of cancerous, as it was first supposed to be by all who saw it. *Many such growths have doubtless been recorded as cancer of that organ.*" This instance shows the value of the microscope in the negative evidence it afforded, and demonstrates how little reliance can be placed on mere outward observation. The tendency of all recent investigations has, however, been to diminish one by one the differences which formerly marked so clearly the divisions of morbid growths, and to bridge over the chasm which separated "malignant" and "innocent," and, at the same time, new terms, such as recurrent fibroid, myeloid, &c., have come into use, pointing rather to the conclusion that the various forms approach one another. The word cancer is, of course, as good as any other mixture of vowels and consonants if all were agreed on its meaning; but, with the present uncertainty as to its interpretation, the use of such a term too often implies very little. In many instances there would be but little variety of opinion as to the character of a growth, when *e.g.*, a mass of cancer is found on the surface of the body, and similar deposits in other parts; but the difficulty arises when small and isolated tumours

are found, such as in the brain, and elsewhere. With nothing but the tumour itself to study, and with no distinctive elements to guide the observer, it is not always easy to find a name which shall give it a correct nosological position. In such cases the word cancer is quite an anomaly, implying, if anything, a resemblance which does not exist, and a relationship which is more than doubtful to such forms as scirrhus and encephaloid. At present there is no other recognised term in use to convey a description, and hence the confusion that so often arises when such cases are brought forward.

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Although no part of the human body seems free from the inroads of malignant disease, yet some organs and structures are, as is well known, more liable than others to be attacked, and many efforts have been made to determine this relative liability. But these estimates, however valuable on special points, can hardly be considered other than incomplete, and this is in a great measure due to the different way in which the subject has been viewed by the several inquirers, as well as to the difficulty of thoroughly investigating the total number of deaths from cancer.

Taking a broad view of the subject, I should say that the external developments of cancer have been much more investigated than the internal, a point which is well illustrated by a reference to the amount of literature expended on cancer of the breast as compared with other organs. Nor is this to be wondered at, for when cancer attacks the breast, the lip, or the face, it cannot fail to be recognized early, and the real nature of the disease is apparent enough, while in almost every case there arises the necessity for surgical treatment.

These circumstances—viz., the readiness of diagnosis and necessity for local treatment, sufficiently account for the greater attention, the more superficial developments of the disease have received at the hands of practitioners, and may further explain how fallacious the ordinary mortuary registers are as guides to the real number of deaths from cancer in particular organs. For a death from malignant disease of the breast or external parts is hardly likely to be assigned to any other than the proper cause, while an equal or greater amount of similar disease in other parts, less accessible to observation, may have hundreds of victims, whose maladies bear any name but the right one. Thus, the presence of a tumour, or some ulceration of the skin causing an obvious disfigurement, would be sure to attract notice, while a scirrhus nodule, equally fatal in nature, involving the intestine, brain, or liver, might kill without producing symptoms to manifest the true nature of the disease. In the one case the disease declares itself, in the other it is latent, unsuspected, or misinterpreted.

But whatever difficulties stand in the way of diagnosis in ordinary cases of disease, are increased manifold in dealing with brain affections, the symptoms of which are generally obscure and uncertain. The symptoms produced by tumour are not often very definite, but supposing the existence or site of a growth determined, it must rarely happen that its nature can be guessed during the life of the patient.

The discovery after death of a tumour in the brain has but too often satisfied observers without any further inquiry into its nature or structure, but the more exact pathology of later years has invoked a careful investigation of all such growths, and opened a new field for study. Without any definite knowledge on the subject of brain cancer, the vaguest notions have gained acceptance, notions which a more exact inquiry has proved to have no founda-



tion in fact. Thus, a man so learned as Cruveilhier has left his opinion on record, that cancer of the brain "is the appanage of advanced age." It was also supposed that the brain was particularly prone to suffer when a cancerous testicle was removed, and Tanchou thought the "frequency of cancerous disease in any organ was in the direct ratio of the importance, constancy of excitement, and impressionable nature of that organ." Not one of these opinions has stood the test of inquiry, on the contrary, they have turned out quite fallacious, and if the Frenchman last quoted were right it is clear that the brain ought to be one of the commonest seats of cancer.

It is to the investigation of this question of the frequency of cancer in the brain that I would now turn.

In publishing a case of this disease last year, I remarked on the rarity of *primary* cancer of the brain, but I was not then aware how fully a more extended inquiry would corroborate this opinion. In the few investigations that have been hitherto directed to this disease, writers have taken no pains to distinguish between the occurrence of primary and secondary deposits; but, in estimating the liability of any organ to cancer, it seems to me of importance to ascertain in what proportion of cases the disease originates in it. Yet, if those cases in which the growths are clearly secondary be included, I believe the total number of cases of brain cancer will be found much less numerous than some have supposed.

In a recent work on medicine by Dr. Aitken, the author gives this as his opinion: "The primary cancer growth commences in the texture of some organs rather than others—for instance, in the uterus and female breast, in the stomach, the colon, the liver, the bones, and the *brain*. Secondary cancers, on the other hand, are most frequently developed in the lungs, spleen, salivary, and lymphatic glands, small intestines and in the serous membranes."

Dr. Walshe, whose book on cancer is still the main authority in the English language, derives most of the brain cases he quotes from foreign authors; but remarks—"In the majority of cases the brain is the seat of but one cancerous growth; several are, on the other hand, discovered in certain instances."

Dr. Hughes Bennett, in the work before alluded to, says—"During the last five years, my opportunities as pathologist to the Royal Infirmary, where I have examined annually between 3,000 and 4,000 bodies, have not been inconsiderable; and yet I have still to meet with a case of cancer of the brain;" and adds in another page—"Knowing what pains and investigation are often necessary to separate epithelial, cartilaginous, and fibrous tumours from cancer, it appears in the highest degree frivolous to draw up tables, like Tanchou, from 9,118 cases recorded as cancer in mortuary registers, or to suppose that any disease whatever really exists, because it is the opinion of medical practitioners that it does so."

It is, of course, difficult to propose any standard of reference satisfactory to all, and I have already pointed out the fallacies attendant on the ordinary death returns; but I think the same objections do not apply to the statistics of the large hospitals, where, it is fair to presume, from the abilities of those attached to such institutions, that cases are sufficiently examined.

There remains, of course, the eternal doubt as to what is cancer; but if the appearance of a growth is fairly stated, every one is at liberty to decide the question for himself; and while there is no special test to apply in order to solve the matter, I do not see how to secure a more definite result.

Considering the advances made in microscopic studies during the last few years, it is hardly fair to attach the same value to the observations of twenty years ago as to

those of more recent date; but probably few will refuse to accept the statistics of the last ten years, as a fair sample of modern pathological research. It will be readily understood that my remarks only refer to those cases examined after death, for no other evidence would be of any value.

Taking, then, a period of ten years (1854 to 1863), I have myself searched the *post-mortem* records of eight of the chief London Hospitals, in order to discover the number revealed by dissection.

The different methods pursued at the various hospitals prevent a comparison of the results on any uniform plan, and accordingly the statistics of each institution are given separately.

Lest it should be thought that any cases are omitted from doubts as to their real nature, every instance of Brain Tumour has been included in the following tables:—

#### GUY'S HOSPITAL.

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Total No. of Post-mortems	-	-	-	2502
„ Brain Tumours	-	-	-	15
viz:—				
Primary cancer	-	-	-	4
Secondary do.	-	-	-	4
Innocent	-	-	-	7

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#### ST. GEORGE'S.

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Total No. of P. M.'s.	-	-	-	2384
„ Brain Tumours	-	-	-	27
viz:—				
Primary cancer	-	-	-	4
Secondary do.	-	-	-	5
Innocent	-	-	-	10
Scrofulous	-	-	-	8

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The St. George's statistics are so far peculiar as to require some further explanation.

In the “Journal of Mental Science” for July, 1864, Dr. J.

W. Ogle published a series of 15 cases of cancer of the brain (with no similar disease in other organs), derived from an exhaustive analysis of the records of St. George's Hospital, and in detailing them, he remarks as follows:—

“I have notes of as many as 25 intra-cranial tumours, which, from their intimate structure, and the history of the cases, may very fairly, I think, be classed in the category of cancerous growths. Out of this number of intra-cranial cancerous tumours, there are no less than 13, in which the morbid growth was found within the brain alone of all the organs of the body. This proportion is, it seems to me, not a little remarkable; but it is one which, considering the number of cases that I have to select from (rare, on the whole, as intra-cranial cancerous growths are), may be looked upon as not improbably approximating very considerably to that which would be found to obtain in other large public institutions.”

The investigations I have made point, I think, to a very different conclusion; and, indeed, the great disproportion between the number of cases at St. George's, and other hospitals of even larger size, is such as to cause at first no little surprise; but a closer examination will afford some explanation.

The cases brought forward range from the year 1841 to 1863, and if this time be divided into two periods, we find that whereas between 1841 and 1850 there were nine cases, from 1854 to 1863 there were only five, or about one-half. I cannot think this is merely fortuitous, but rather the result of a stricter classification, and more searching investigation.

If we examine the cases individually, many reasons suggest themselves for doubting their claims to be cancerous. Without being very captious, we may fairly ask, where is the proof of cancer in the first *five* cases, which are only assumed to be “encephaloid,” or “fungoid,” without, except in No. 2, any description, and not one of which was ex-



amined by the microscope? Case 6 was said to have no nucleated cells—the most usual proof of cancer. In case 9, a “tumour the size of a hazel-nut” was found in the left lateral ventricle, and called cancer, though there were scrofulous deposits in the lungs, kidneys, and prostate.

In case 13, a tumour in the Pons was called strumous, and another attached to the membranes carcinomatous, but for what reason does not appear. The patient died of phthisis.

In cases 11 and 12, there is a mere assertion that the tumours were cancerous, and the description of No. 12 hardly warrants the supposition.

It will be seen that the number during the last ten years approaches very closely that observed at other hospitals, and is probably more correct than the larger one. Many growths were formerly styled cancer, to which the title would now be denied, and I think we should require more evidence than the mere opinion of the observer before accepting all such instances.

#### ST. BARTHOLOMEW'S.

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Total No. of Brain Tumours	-	-	-	6
viz :—				
„ Primary cancer	-	-	-	1
„ Secondary	-	-	-	1
„ Innocent	-	-	-	2
„ Strumous	-	-	-	2

I have omitted two cases—one, a growth from the dura mater pressing on the brain, and, therefore, not a proper brain tumour; and the other a “cancerous deposit around optic nerves,” but of the latter I have some doubts, inasmuch as it is stated that the lungs contained miliary tubercles, and that the brain tissue was softened by pressure, *but not infiltrated*, two rather strong reasons against the cancer hypothesis.

At this hospital no formal records are kept of all the

P.M.'s, but select cases are detailed. This may account for the small proportion of brain cases in such a large field of practice; yet brain tumours are less likely to have been passed over than other cases.

#### LONDON.

Out of a total of 779 P.M.'s. recorded there is but one instance of a single brain tumour (nature not stated), and two more of growths on dura mater.

#### ST. THOMAS'S.

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Total No. of Brain Tumours	-	-	-	14
No case recorded as primary cancer.				
„ Secondary cancer	-	-	-	3
„ Strumous	-	-	-	1
„ Hydatid	-	-	-	1
„ Growths (cancs. and not) of arachnoid				2
„ Innocent	-	-	-	7

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#### KING'S COLLEGE.

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Of 441 P.M.'s recorded				
Brain Tumours	-	-	-	3
viz:—				
Perhaps primary cancer	-	-	-	1
Secondary	-	-	-	1
Cyst	-	-	-	1

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#### MIDDLESEX.

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Of nearly 700 P.M.'s recorded				
Brain Tumours	-	-	-	3
viz:—				
Secondary cancer	-	-	-	1
Scrofulous	-	-	-	1
Cancer of orbit involving brain				1

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#### ST. MARY'S.

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Of about 700 P.M.'s recorded				
Brain Tumours	-	-	-	5
viz:—				
Syphilitic	-	-	-	1
Cyst	-	-	-	1
Innocent	-	-	-	1
Scrofulous	-	-	-	2

The time over which the above observations extend, is not exactly the same at St. Bartholomew's and St. Thomas's as at the other hospitals, as the records were incomplete for the full term of ten years, but in these instances nothing earlier than 1850 has been noticed.

The Museums of the London Hospitals most of them contain specimens of brain cancer; but, as a rule, no distinction is made in their description as to the co-existence of similar disease elsewhere in the body.

At Guy's there are eight specimens, in five of which it is stated there was also cancer in other organs, but in the remaining three there is no further history.

At St. Bartholomew's there are two preparations, at King's College a few, and at St. Thomas's several; but, except in two cases, from the latter hospital, that I have given in detail, there is no other information about them than that afforded by the catalogue.

The only remaining source of information is a reference to published cases, the paucity of which is in itself a proof how rare this affection is. I have appended an abstract of all the cases I have been able to find, after a long continued search through the serial publications of many years past, the Pathological Transactions, and other works bearing on the subject, and have excluded no case bearing the title of cancer of the brain.

I have classed separately those cases derived from hospital records, and which, as recent and hitherto unpublished, may be supposed to have a special interest and value.

## C A S E S.

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FROM THE P.M. RECORDS OF GUY'S HOSPITAL.

*Carcinomatous Tumour of Cerebellum.*

Charles W., æt. 6, admitted into Guy's, March 9, and died June 28, 1861.

*Bodily Symptoms.*—Was hydrocephalic, and quite blind. The limbs were rather wasted; he was unable to stand, and lay supine in bed till death, the head increasing in size, pupils dilated, and blindness remaining.

*Mental Symptoms.*—His intellect remained clear to the last, though he was somewhat slower in his speech, as though requiring greater effort to articulate.

*Post-mortem.*—Head immensely enlarged. On removing the dura mater the arachnoid appeared healthy, but the brain like a bag of fluid, so that, if unsupported, it would have ruptured by its own weight. The stretching of the convolutions was very remarkable, the width of these being in some places more than double the usual size seen in an adult, and this was most evident in the posterior lobes.

On removing the brain an irregularity was seen on the lower surface of the cerebellum, on cutting through the middle of which a cancerous tumour was seen, about the size of a billiard ball. This was more or less round,—was firm, and the section shewed a well marked cancerous appearance, being pinkish in colour, vascular, and emitting a milky juice. It encroached on the 4th ventricle, but did not penetrate into it. The *tertio ad quart. ventric.* was freely open. No disease, such as cancer, in any other part of the body. All the organs healthy.

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*Malignant Tumour in Cerebellum.*

A man, æt. 26, admitted September 13th, 1854, and died October 9th following. Had been ill for twenty weeks before admission.

*Bodily Symptoms.*—Pain in back of the head, and vomiting; general weakness of limbs; difficulty in feeding himself; partial paralysis of left side of face; could not close left eye, nor move it outwards, and imperfect vision.

*Mental State.*—Retained his senses to the last.

*Post-mortem.*—A tumour was found in the cerebellum, occupying more of the left than the right lobe, only a slight layer of brain substance covering the tumour in the left lobe. The tumour was as big as a large egg, and well defined, of the consistence of the brain, pinkish in colour and very vascular. From the cut surface was scraped a thick fluid, like pus, which became mucoid on the addition of liq. potassæ. The microscope shewed the tumour to be made up of granule cells, nuclei, and a fine fibrous matrix. Other organs healthy.

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*Cancerous Tumour in Brain.*

George N., æt. 37, admitted April 12, and died May 24, 1858.

*Bodily Symptoms.*—Pain in head, left side observed to be weaker than the right. Had received two separate injuries to the head.

*Post-mortem.*—Recent arachnitis. A tumour, the size of a small hen's egg, was found at the posterior part of the right ventricle. It had grown within the posterior lobe of the right hemisphere, entered the ventricle, and encroached on the thalamus opticus; was circumscribed and firmer than ordinary brain tissue. The cerebral substance around was softened and infiltrated with recent lymph. The tumour was composed of a highly vascular pink-coloured growth, mixed with materials less vascular, and of an opaque white colour, the latter being firmer than the other, and emitting a juice. It had the ordinary appearance of cancer, and was seen under the microscope to be composed of nuclei, nucleated cells and fibres. The large size of the nucleated cells, and their grouping together in clusters, could scarcely suggest any other name for the tumour than that of cancer.

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*Cystic Disease of Brain-cancer?*

Jano F., æt. 34, admitted May 5, and died Aug. 8, 1860. Had been ill six weeks before admission, with symptoms supposed to be hysterical.



*Bodily Symptoms.*—An inward squint of right eye, vomiting, headache, and dimness of vision, followed by severe pain at the back of the head, varying in amount, pain and stiffness in the eyeballs, and moaning in respiration. The vomiting ceased six weeks before death, and the appetite became voracious. The patient partook a good deal of food, but wasted exceedingly, and during the whole period respiration was very irregular and she was constantly yawning.

*Post-mortem.*—Two cysts were found in the right hemisphere, and two in the left.

The microscope showed that the contents of these cysts, whose walls were delicate and highly vascular, consisted of nuclei, some oval, and many showing a tendency to growth, while granule masses were abundant in the brain tissue around. There were no deposits in other organs.

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#### *Cancer (Colloid) of the Brain.*

A man, æt. 57, admitted into St. Bartholomew's in 1860.

Three months before admission he was subjected to great alarm, on account of the narrow escape from fire of his daughter, and became at that time, after severe headache, insensible, convulsed, and then paralysed on the left side. This hemiplegia persisted, and he also became subject to epileptiform seizures, 12 to 20 occurring in a day.

*Post-mortem.*—In the right hemisphere a morbid growth was discovered, which had a soft gelatinous character, with circumscribing septa of a fibrous nature. Towards the middle the gelatinous ingredient became diffuent. Under the microscope it presented the ordinary appearance of colloid cancer. The other parts of the brain were healthy, as were also the other organs.

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#### FROM ST. THOMAS' HOSPITAL.

##### *Fungoid Disease of Cerebellum.*

James S., æt. 22, died June, 1849.

*Post-mortem.*—Between the two lobes of the cerebellum, and in the cerebral substance, was a cyst about  $1\frac{1}{2}$  inch in diameter, lined with a thick, yellowish, translucent membrane, and filled with a clear, yellow, bilious-coloured fluid. External to the cyst at the posterior and right lateral part was an oblong tumour about 1 inch in length, and half an inch in breadth, developed in the substance of the cerebellum, and protruding into the cyst described above; the projecting portion of the tumour was still covered by the lining membrane of the cyst, and beneath it was some recently extravasated blood. The tumour consisted principally of nucleated cells of round form and large size. No disease in other parts.

The remaining cases have been previously published.

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#### FROM THE MEDICO-CHIRURGICAL TRANSACTIONS.

##### *Cancer of Cerebrum and Cerebellum.*

A young lady æt. 17, of previous good health, and without any assignable cause for illness, began to complain of severe headache, early in 1821. In May she was worse, and had a regular exacerbation of pain every morning. The pain was very severe, and referred to the right temple. She had *vertigo*, great dread of imaginary objects, dulness of hearing, indistinct vision, and was in a state of high nervous irritation. On August 31 she was seized with violent convulsions, which lasted half an hour. After this it was found that she had lost all power over her body, though she could move her legs and arms a little. Sight was so far lost that she could barely discern the difference between light and darkness. The deafness was greatly increased. The bowels were costive. She had vomiting and gastric pain, and the headache was intense. These convulsions returned in a few days and continued to do so till death. Sight and hearing were soon lost altogether, and taste, if any remained, was very imperfect. Her intellect remained unimpaired, except when under the influence of the fits; and she would amuse herself by conversing with her attendants on the fingers, and acquired great facility in this method of communication, guessing the words before they were half spelt.

She was aware of her hopeless condition, and evinced great patience, and even cheerfulness, and wished her head to be opened.

She died October 5th 1823, completely exhausted.

*Post-mortem.*—The bones of the cranium were extraordinarily thin, and several short spicula projected inwards, from the posterior part of either parietal bone.

Membranes healthy. The cerebral substance was softer than usual. There were some 8oz. or 10oz. of fluid in the ventricles, whose lining membrane was of a dingy yellow colour. The thalami optici were somewhat enlarged, irregular on the surface, and converted entirely into the fungous disease, a longitudinal section presenting exactly the appearance of a portion of coagulated blood. The corpora striata were not affected, but the disease extended into the adjacent parts of cerebrum and cerebellum below, and also to the lower and posterior edge of falx major. Spinal cord healthy. The thoracic and abdominal viscera were carefully examined throughout, but no diseased appearance was found.

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*Encephaloid Tumour of Cerebrum.*

In the *Lancet* of Feb. 15th, 1840, the following case—apparently observed at the Child's Hospital in Paris—is recorded by Dr. Hennis Green, who introduced it with these remarks:—

“Cancer of the brain is an extremely rare affection; it is still more rare in children than adults. The following is the only example which I have seen in more than 800 cases of cerebral disease occurring amongst children.”

Philip P., æt. 12, admitted into Hospital May 18th, 1833.

*History.*—For the last 6 months the boy had had frequent convulsive attacks, confined to the right side of face, trunk, and right arm—each attack being preceded by headache and numbness of the arm. No other symptom of disease of the nervous system was perceived. The following particulars as to the attacks were noticed on his admission:—After two or three hours' headache, the boy felt some numbness in the right arm. He then felt a sensation as if something ascended from the back of the hand to the chest, and immediately afterwards the limb became affected with convulsive movements. The muscles of the right eye and side of the face and chest were also convulsed. The attack lasted two or three minutes, and then ceased—the patient never losing consciousness, nor presenting the appearance of one in an epileptic fit, and during the convulsion he was able to answer, with the utmost clearness, any questions, but the articulation of sounds was slightly impeded.

The disease was judged to be a simple neurosis, and treated by anti-spasmodics with apparent success: for the boy left the Hospital on Aug. 2nd, having had no fits for 15 days. He was, however, re-admitted Sept. 4th, and remained till his death, which took place March 30, 1834.

During this period, the power of moving the right arm gradually diminished, and was at length completely lost. The boy frequently complained of pain on the left side of the head. He continued in this condition till March 17th, when he suddenly fell into a state of coma, accompanied by contracture of the limbs.

19th—Had complete coma, squinting of right eye, the pupil of which was contracted, the left pupil being dilated; contraction of upper extremities, particularly the right, the sensibility of which side was also diminished, and delirium, with plaintive cries. After rallying on the 23rd sufficiently to answer questions when spoken to, he became comatose, and died on 30th.

*Post-mortem.*—Dura mater adherent to cerebral membranes to the extent of two inches square. On the surface of the middle lobe of left hemisphere, at the point where the dura mater adhered, is seen an encephaloid tumour, of the size of a hen's egg; it is irregular in form, included in a cyst, and contains numerous bloody points not larger than pins' heads, but is not softened. The tumour extends into the lateral ventricle, and has destroyed the whole of the left corpus striatum. The nervous tissue surrounding the tumour is completely diffuent, and behind these is a serous looking cyst, which contains about 3 oz. of clear fluid. The cyst is merely separated from the ventricle by a layer of membrane resembling a serous one. The adjacent nervous tissue is but slightly softened. The rest of brain and cord healthy. The thoracic and abdominal viscera were healthy, excepting some unimportant appearances noted in the stomach.

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THE TWO FOLLOWING CASES ARE RELATED BY DR. COWAN, OF THE BERKS HOSPITAL, IN THE “PROVINCIAL MED. AND SURG. JOURNAL” FOR 1845:

*Cancerous Tumours in both Cerebral Hemispheres.*

A lady, æt. 35, of habitual good health, two weeks after a miscarriage with severe flooding, was seized with hemiparesis (left), a distressing whizzing, pulsatory noise in the right ear preceding the paroxysms, which were, when at their height, associated with severe lancinating pain through the right arm and leg.

*Symptoms.*—Tinnitus never ceased, but there was no deafness. Vision was affected for the last three or four weeks of life—the patient being liable to sudden darkness and confusion of sight, particularly of left eye. The headache extended to right side, and amounted to a general uneasy feeling rather than pain, and the attacks became quasi-epileptic, as indicated by sudden stillness, stupor, and insensibility, with occasional rigid extension of the legs and left arm. All mental and muscular efforts tended to bring on these attacks.

She died in six weeks, having walked down the same day. Throughout the illness, there was no appreciable mental disturbance—no permanent paralysis—nor any interception of the will.

*Post-mortem.*—Much to their surprise, the doctors found the brain affected with malignant disease; cancerous tumours were found in the interior part of the middle lobe of right hemisphere, where it rested on the temporal bone, and in the centre of the posterior lobe of the left, while similar disease penetrated into the ventricles, and to the posterior surface of the *optic thalamus*.

### *. Encephaloid Carcinoma of Cerebellum.*

Mrs. C., æt 44, early in 1844 suffered from headache, and, after great mental anxiety and fatigue, was observed to lose flesh and strength, and to be excited and restless. She died in Feb., 1845, and the progress of the disease was marked by the following symptoms.

*Symptoms.*—Peculiar fidgetty sensations in the legs, numbness of left cheek, staggering gait, like that of a person slightly intoxicated. Headache became more intense, and vomiting was frequent. In June, a sort of “fit” left her with impaired utterance, deafness of left ear, and anæsthesia of left cheek. The headache soon after diminished, but the other symptoms grew worse, and for three months the patient was liable to hysterical fits of laughing, excited by the most trivial causes. Subsequently deglutition became difficult, and there was strabismus of the left eye, blindness, and a general loss of power over the limbs, not amounting to positive paralysis, but to a loss of co-ordinating power.

Mental condition was characterized by excitement and restlessness, distress, and efforts to conceal what she felt to be at variance with her natural habits and feelings.

*Post-mortem.*—A dark red spongy and highly vascular substance, presenting all the well-known characters of encephaloid carcinoma, was found incorporated with the ant. extremity of left lobe of cerebellum, of which it seemed a prolongation. Passing forward, in inseparable connection with the pons varoli, and following the emerging fibres of the corresponding crus cerebri, it terminated about an inch further, without penetrating the ventricle in the medullary substance of middle lobe. The line of separation between the diseased and healthy structures was indistinct. A small nodule, the size of a pea, was embedded in the right lobe of cerebellum.

### FROM DUBLIN QUARTERLY JOURNAL OF MEDICAL SCIENCE.

AUG., 1849. (Reported by Mr. CARLINE).

#### *Cancerous Tumour of Cerebrum.*

A soldier, æt. 19, began to complain in Aug., 1846, of weakness of both knees, coming on gradually, and rendering him unable to stand for any length of time. He was treated for this, and nothing particular was noticed in him till Sept., 1848, when he suffered from headache, which continued more or less till Nov. 22nd, when it was described as frequent attacks of acute pain over frontal sinuses, coming on at intervals. Dec. 4th. Left pupil considerably dilated, and does not contract freely when tried in the usual way; the eye-lid also droops so as to nearly cover the eye, and there is slight lachrymation, dimness of vision, and diplopia. These symptoms, however did not last long, and the pain lessened in the course of the next month; but early in March, 1849, the pain returned with great severity in the left eye, and the following note was made of his condition:—He has a dull countenance of pale leaden hue, defective vision, as well as diplopia of the left eye, which is the more prom-



inent, and its pupil dilated; he has also deafness of left ear, distortion of the mouth, defective utterance, loss of smell, and occasional pain in left eye, and side of forehead and cheek. On March 29th he was proposed for invaliding, as labouring under nervous affections dependent on some organic disease of the brain and left optic nerve. He improved somewhat in April, but on May 11th suddenly became exceedingly restless, tossing his head from one side to the other; was comatose in less than half-an-hour, and expired without a struggle in three and-a-half hours.

*Post-Mortem.*—On examining the brain the left anterior lobe was found adherent to the membranes, and the greater part of the base of the anterior, the whole of the middle, and part of the posterior lobes were softened and diffuent, as high as the lateral ventricles, from the centre of which sprouted a cancerous mass. The other viscera were healthy.

Dr. Neligan examined the tumour, and reported that it was "of dense consistency, exuding a creamy fluid, and was of a greyish yellow colour. A thin section under the microscope, with a power of 250 linear, presented a fibrous structure arranged in striæ embedded in which were nucleated corpuscles (cancer cells), and several compound granule cells, which were rendered much more transparent by acetic acid. The creamy fluid scraped from the surface of tumour contained numerous minute granules, compound granule cells, and nucleated corpuscles."

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FROM THE PATHOLOGICAL TRANSACTIONS. VOL. 2., p. 48. (Dr. BENICE JONES.)

*Hæmatoid Cancer of Cerebrum.*

A man, æt. 62, had no material ailment till within six months of his death, when he was seized with an epileptic attack, followed by delirium tremens. A month later he had another fit, and from this time the mind gradually lost its power. About a month before he died he found he could not button his trousers, and, after this, complete paralysis of left arm ensued, and the voice became reduced to a whisper.

*Post-Mortem.*—A tumour was found in the substance of the brain, resembling the hæmatoid variety of encephaloid. It consisted of an aggregation of very delicate and feebly formed celloid particles, not resembling true nuclei and nucleated cells, but vesicles with faintly granular or homogeneous contents.

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VOL. 4., p. 16.

*Cerebral Cancer.*

A boy, æt. 7, had good health till within a few months of his death, when he had loss of appetite, restlessness, and frequent desire to evacuate. His mother observed his left arm frequently drawn backwards, and fixed in that posture.

In September, 1852, after a short period of improvement, he began to complain of headache, and diarrhoea, and again became restless and very talkative, stuttering as he spoke. His gait became unsteady, his character more childish; and his features assumed a constant expression of laughter. He had a voracious appetite, and sickness after meals. In October he was emaciated, extremely restless and talkative, without delirium, had slight strabismus, and total loss of sight in the right eye. He was desirous of moving constantly about, which he did with a rolling, tottering gait, talking constantly of surrounding objects, whilst his face continued to assume an expression of unmeaning laughter. Afterwards came on violent screaming, sickness, blindness, drowsiness and coma, and he died exhausted in December.

*Post-Mortem.*—On removing the brain a tumour, about 3 inches long and  $1\frac{1}{4}$  wide, was found occupying the space between middle and anterior cerebral lobes. Its small extremity lay within about three lines of the pons, whilst the front and larger portion lay beneath, and was partially embedded in the right anterior lobe; the portion of the lobe, forming its bed, having lost its grey matter apparently by absorption, consequent on pressure.

The thoracic viscera were healthy, except the lower lobe of left lung, which was solid, but had no tubercle.

Mesenteric glands were enlarged, but not tubercular.

Mr. Toynbee reported on the specimen, and said:—"On section, it was observed to consist of,—1, a dense capsule; 2, a matter about as firm as the healthy recent pons. var., and having somewhat its colour and consistence; 3, a pulpy matter, having a dark grey colour, and containing a large number of blood vessels, distended by dark coloured blood.

By the microscope the capsule was found to consist of dense fibres, and the harder



portions of extremely delicate fibres, among which a few nucleated cells were interspersed. The softer gelatinous substance consisted of nucleated cells, granulated cells, and delicate fibres. The tumour had the general appearance and character of encephaloid growths, the granular cells and fibres being more abundant than in ordinary specimens."

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VOL. 5.—(DR. MARKHAM.)

*Cancerous Tumour in the post. lobe of Right Hemisphere of Brain.*

A man, æt. 54, had enjoyed good health generally; but two months before admission to hospital had numbness in his left hand and leg, and pain at the top and back of his head. A week before admission he quite lost the power over his left leg, and when taken into hospital he was only half conscious. The left arm was quite powerless; and though he could move the left leg, it was more rigid than the right. He died in two days.

*Post-Mortem.*—At the upper and lateral portion of post. part of right hemisphere the dura mater was rough, and adhered for a circumference of about three-quarters of an inch to a round projecting slightly fungus-looking growth, opposite to which the skull was roughened. This projection was the upper part of a cancerous growth, the size of an orange, lobulated, hard at points of its circumference, and reaching down to the lower part of cerebrum. It occupied the greater part of the post. lobe, was surrounded everywhere, except below, by cerebral matter, which seemed perfectly healthy) and was well defined in outline. In appearance, when microscopically examined, it was of a cancerous nature; some of the central portion was soft and yellow,—the matter being degenerated into granular well defined particles and cells, containing dark granules. The hard, and in some parts crispy, portions around, exhibited a large number of nucleated and spindle-shaped cells, when the juice scraped from them was examined under the microscope.

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VOL. 7. p. 18.—(DR. HILLIER.)

*Cerebral Cancer.*

A man, æt. 36, admitted 3 weeks before death into St. Pancras Infirmary with headache and cold, but no paralysis. He became comatose after taking 10 gr. of Dover's powder, and on recovery was found to have less power in his right limbs than in the left. The intellect was dull. He had many comatose attacks, without convulsions, lost control over the sphincters, and had anæsthesia of the lower extremities, but motion was not much affected, and he died comatose.

*Post-Mortem.*—On the left side of the upper surface of cerebrum was a prominence of the dura mater, like a thrush's egg. On first slicing the hemisphere the brain in front was found of a peculiar yellowish aspect, rather softer than usual, if anything. This altered portion was separated from the rest of the brain by a tolerably firm capsule. The lower two-thirds of the mass turned out without tearing the surrounding brain structure. On section the mass resembled yellow tubercle at some parts. At others, and near the centre, encephaloid cancer.

Mr. J. Hutchinson, who was requested to report on the specimen, observed,—“The question as to classification seemed to be between myeloid and cancer. Its abundance of cell forms and nuclei was suggestive of rapid growth and malignant nature. Those of the cells most resembling myeloid bodies, had yet some features of difference, inasmuch as they were three times the ordinary size of such, and their contained nuclei were also very much larger. The tumour ought probably to be regarded as an example of a form of cancer peculiar to the brain, and differing in several points from those met with in other localities.”

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VOL. 7. p. 26.—(DR. WILKS.)

*Cancerous Tumour of Pons Varolii.*

A girl, æt. 10, had good health till 8 months before her death, when she began to complain of headache and frequent vomiting, and a month later of twitchings of the muscles and slight strabismus. Subsequently she had violent frontal headache, which increased at night; and during the last three weeks of life she had a numbness in her right arm. Her mind was always clear.

*Post-Mortem.*—Growing from the pons varolii was a large irregular-shaped mass of disease, undefined in appearance at first, and so interwoven with the brain structure that it seemed like the pons swollen to double its natural size. This flat-

tened appearance was found to be due to the pressure it had undergone against the floor of the skull: for after it had been in fluid, the tumour presented a remarkable lobulated growth, and was divided into two lateral halves by the basilar artery. Each half consisted of three or four lobes, which grew directly outwards, and could not be distinguished from ordinary cerebral structure; but after being placed in spirit, the true brain tissue became more opaque and hard, and then the adventitious growth made itself more manifest. By the microscope, it was found composed of a tissue, for the most part, of large nuclei and delicate fibres. The latter were of great length and extreme tenuity, and the nuclei dispersed among them were very large, and very numerous.

Dr. S. Wilks, who presented the specimen, adds—"From the peculiar formation of its groundwork and nucleated cells, I think it must be styled carcinomatous. This leads me to express an opinion that not only should there be an endeavour to classify the morbid growths which occur in the human body according to their structure, but that greater study should be given to investigate the diseases of particular organs, which are probably to a great extent peculiar to each."

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VOL. 10. p. 26.—(DR. HILLIER).

*Encephaloid Tumour attached to the Cerebellum.*

A Male child, æt. 3 years and 9 months, was brought to Hospital, Feb. 23th, 1858, the only symptom being obstinate vomiting of a month's duration. Ten days after admission, he was seized with convulsions, in which the arms were stretched out, —the hands being flexed, and he was nearly unconscious. From this time convulsions, with rigidity of the limbs, became more frequent, and the sickness more troublesome. On 23rd March, he had a series of convulsions during nine hours, and for the first time complained of pain in the head. He died the same day.

*Post Mortem.*—No tubercular deposit was visible at the base or elsewhere in the brain, but there was found attached to the membranes of the under part of the left cerebellar lobe, and indenting but not embedded in the cerebellum, a roundish lobulated mass, about the size of a large walnut. It was enclosed in a distinct thin membranous capsule. On section, it presented the usual naked-eye characters of encephaloid cancer, and on pressure a creamy juice exuded. On microscopical examination, the juice presented numerous round nuclei, with distinct nucleoli, also a considerable number of finely-shaded round cells, with large well-defined nucleolated nuclei. The substance of the tumour was made up of similar cells.

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FROM THE CATALOGUE OF ST. THOMAS' MUSEUM.

*Fungus hæmatodes of cerebrum.*

SEC. N. 84 (P. 247), A portion of left hemisphere of brain containing a mass of fungus hæmatodes, the size of a large egg . . . When recent the tumour consisted of distinct lobules enveloped in highly vascular membranes, it was in parts translucent, and under the microscope seemed to be made up entirely of large nucleated cells.

The specimen was taken from a woman, æt. 27, who had had good health till within six months of her death. She had convulsive fits, which were succeeded by others at intervals of two weeks, and partial hemiplegia came on eight weeks before death. During the last two weeks she was at times almost in a state of stupor, but could be roused, and then appeared rational and sensible. Twelve hours before death she was seized with an epileptic fit, and then sank into a state of complete stupor.

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FROM THE JOURNAL OF MENTAL SCIENCE, APRIL, 1864.

(By Dr. G. MACKENZIE BACON).

*Primary Cancerous Tumour of Cerebrum.*

*Congenital imbecility—Attacks of recurrent mania—Imperfect hemiplegia—Subsequent paraplegia and death—Post-mortem appearances—Tumour of brain (probably cancerous)—Microscopical examination.*

Stephen K., æt. 34, a labourer, was admitted into the Norfolk Asylum for the second time in July, 1861, and remained till his death, May 3, 1863. He was from birth of deficient intellect, but pursued the even tenor of his ways pretty harmlessly till about the age of puberty, when he became violent, and liable to wander away. Hitherto he had lived with his mother, and been at times employed in the fields, but he was now sent to the County Asylum, where, however, he was not detained very long. For seventeen years he remained at large, under the care of his mother, and

was returned to the Asylum in July, 1861. At that time he appeared to be a stout, hearty countryman, robust and rubicund. His mental capacity was very small, and he was described as "a good-tempered fool, unfit for any steady employment, and quite satisfied with passing his time in shouting at the train, and in running wildly about the courts." For the next year he had recurring attacks of mania, more or less active, being during them noisy and demonstrative, but not violent.

In May, 1862, he first showed signs of bodily ailment, the muscular power of the left leg and arm being much impaired. These symptoms came on very gradually, and he could all the time drag himself about, though unable latterly to dress without assistance, but after a month he improved a good deal.

In September he was weaker, and both his lower limbs were then most affected, the left arm having almost recovered its motile power. During the previous six months he had been occasionally noisy and excited, but much less so than formerly.

In December he was quite paraplegic, had but little sensation in the legs, and complained a great deal of lumbar pain. He was quiet, had to be fed regularly, and required great attention, and seemed indifferent as well as of diminished intelligence. For the last four months of his life he remained a helpless lump, and died very gradually, not particularly wasted, without bed-sores, or any obvious indications of disease, beyond the paraplegia.

*Post-mortem.*—Body somewhat emaciated; viscera in chest and abdomen healthy; membranes of brain healthy. On slicing the right hemisphere, the white centro had a bright pinkish hue, and seemed softened, but on continuing the section deeper the cerebral substance was denser, and the right ventricle when exposed was found almost obliterated by a hard mass of gelatiniform appearance, with spots of effused blood, like old apoplectic clots. This mass extended upwards through the roof of the ventricle, causing an induration of some portion of the hemisphere, and was of the size of a small orange. A similar growth, of less size, was seen commencing in the left hemisphere, but external to the ventricle.

*Microscopical Examination.*—Dr. Eade, of Norwich, kindly examined the tumour, and furnished the following particulars of the microscopical appearances:—"The tumour presented an irregular nodulated appearance. Sections of various portions of it showed a more or less brain-like appearance, and a varying degree of consistency.

"Under the microscope the following elements were found:—

"1. Large irregular cells, mostly with one large eccentric nucleus.

"2. More or less rounded or oval cells, with one nucleus, which was variously centric or eccentric.

"3. Cells in every stage of elongation and fibrillation, from the mere oat-shaped or pyriform cell to the long delicate fibrillæ or fibro cells. These elongated cells were all granular on the surface, and many of them had a long, bulging, central nucleus, some appearing more or less perfectly joined at their extremities in a rudimentary attempt to form fibres. These elements varied greatly in relative amount in the different portions of the tumour; the firmer portions containing the largest proportion of fibres, and the soft and diffuent portions being chiefly composed of the rounded or oval cells."

The writer regrets that no examination was made of the spinal cord, but illness prevented his completing the autopsy.

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While staying in Florence lately (1864), I found in the Pathological Museum of the large hospital known as *S. Maria Nuova*, a specimen of primary cancer of the brain, so interesting in itself, and so well illustrating the subject, that I append the following history of the case derived from the records of the museum.

**PRIMARY CANCER OF BRAIN.**—*History.*—A man, æt. 28, had suffered from epilepsy from infancy. During the last few months of his life he became almost blind, and for this reason came to the hospital for treatment. He got no benefit from the means employed, the epileptic attacks became worse, and he died one day after a fit of unusual severity.

At the *post-mortem* a cancerous tumour was found in the brain. It was of great size; when fresh had the colour of bright peach blossom; was of gelatinous and semi-transparent aspect, and situated in the right cerebral hemisphere. The cancerous mass extended upwards to the under surface of the cortical structure, forwards nearly to the anterior extremity of the hemisphere, backwards as far as and invading the thalamus opticus, and downwards as far as the level of the base of the brain. An horizontal section made immediately below the corpus callosum on the right side, showed the extent of the surface of the tumour, the colour of which was lighter than that of the cerebral substance surrounding it, while it was seen to stretch



across the greater part of the breadth of the left ventricle. The middle cerebral lobe was quite pushed back by the morbid growth which rested on and compressed the olfactory nerves. The meningeal veins were gorged, the cerebral convulsions flattened, and the ventricles contained half a pint of limpid serum. *No cancer existed in any part of the organism*, though a most careful examination was made, assisted by the microscope. A microscopical examination of the tumour showed cancer cells, many of which were incomplete, because reduced to a single nucleus, with a diameter of 18 to 24-1000th of a millimetre, whilst those cells that were entire had a diameter of 24 to 36-1000th of millimetre.

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FROM THE LANCET.—OCTOBER 22nd, 1864.

*Tumour of the Right Side of the Brain of a Malignant Nature.*

(DR. FULLER.)

A woman, æt. 56, was admitted into St. George's, January 27th, 1864.

*History.*—She was in her usual health till the night before her admission, when she was seized with vomiting, and had been ever since comatose and paralysed on the left side. The next day she was observed lying on her back, making movements with the right limbs, as raising the right arm over the head and flexing the right leg. The face was not distorted nor unsymmetrical, though the muscles of its left side were weakest; she spoke faintly, as one in a dream, but paid little regard to questions. Deglutition was difficult.

February 4th.—Had regained some slight power over the left arm. She was still drowsy, but quite rational, and complained of frontal headache. The pulse was soft and quiet; the tongue pushed over to the left side. She continued without much change for some time, rather improving in intelligence, but still preserving the manners and appearance of a narcotized person.

Early in March bed-sores formed, and on the third the following was her condition:—"Features drawn to the left side; muscles of left arm contracted; motions passed in bed; palsied arm much wasted; she has power enough to raise the left hand a little; there is much cardiac impulse, a small pulse of 102, and clammy skin."

March 7.—Lying as before, but foaming at the mouth. She died quietly the same evening, without any sterter.

*Post-Mortem.*—Both sides of the brain were flattened,—the right side so much that scarcely any depression existed between the convolutions. When the brain had been sliced to near the roof of the ventricles, the one on the left side bulged up much, and was found to contain about 1½ oz. of limpid fluid. The ventricle on the right side did not contain any fluid, but its walls were in close contact; and the septum was greatly deflected to the left: it was unbroken. On removing the brain, it was found that the dura mater was closely adherent to the base of the right middle lobe. This portion of the brain projected most remarkably, when the organ was laid with its base upwards. A growth extended from the ant. to the post. boundary of the middle lobe, and lay so close to the inferior dura mater as to adhere to it. Laterally there was a layer of cerebral tissue which separated it from the dura mater of very trifling thickness. The mass reached vertically for 2 inches. It lay between the lateral boundary of the brain and ventricle. The corpus striatum and optic thalamus were not encroached upon, but were pushed towards the centre. The texture was various. It was spongy, and contained serum. In many places it was yellow and translucent, so as to resemble coagula from the heart; in some places it was more white and friable; here and there it was rusty-looking and blood tinged. Under the microscope the more friable and opaque parts consisted of a vast variety of cells,—angular, caudate, fusiform and globular. "These were generally without nuclei, although some were exceptions. Their contents were small granules. Nothing resembling malignant disease was found in any part of the trunk."

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The symptoms produced by any brain tumour depend so entirely *on the accident of its position*, that I have not thought it would serve any useful purpose to analyze those detailed in the cases quoted. There is nothing in the

vital properties of a growth, that in any way affects the value of the symptoms it causes; and so far the semeiology of the cancerous is not more instructive than that of other tumours. For purposes of diagnosis, the mental symptoms produced by tumour are of the smallest value, and it is easily shown that this cause is one of the least frequent of mental disease; indeed, the ordinary statistics of public asylums might be used to swell the negative results of such an inquiry, to almost any amount. The bodily symptoms such as pain, paralysis, sickness, &c., must vary with the position of the tumour, and it may happen, as in the case of Stephen K., reported by myself, that a growth may form in the cerebral substance, and attain considerable size before there is any reason to suspect its existence.

The 21 cases I have quoted suggest some points worth notice as regards the sex and age of the patients; for of the whole number, no less than 14 were male, and only 7 female, while four-fifths of the sufferers from what Cruveilhier called the "appanage of advanced age" were under 40. Of the 21 cases, 5 were under the age of 12, 2 between 12 and 20, 4 between 20 and 30, 5 between 30 and 40, 1 between 40 and 50, 3 between 50 and 60, and 1 had reached 62.

I know of no other published cases than the above, except the series related by Dr. Ogle, in the *Journal of Mental Science*, (July, 1864). Having already remarked on these cases, I have thought it better merely to refer to them now than to make any selection.

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